

CLAIMS

1. A mask system for treating sleep disordered breathing comprising headgear, a shell/cushion including a channel adjacent a front aperture, a frame, an elbow including at least one undercut on a proximal end and a retaining ring including a rear flange adapted to be retainably insertable in the channel of the shell/cushion and a front flange adapted to retainably engage with the at least one undercut of the elbow.
2. A mask system as claimed in claim 1 further comprising a thin walled section adjacent the channel of the shell/cushion which is adapted to tear upon removal of the elbow.
3. A mask system for treating sleep disordered breathing comprising headgear, a frame, and shell/cushion including a frame-receiving channel defined by a front flange and a rear flange, the front flange extending 75% to 100% of the way around the perimeter of the shell/cushion, wherein the frame is adapted to be removably insertable in the frame-receiving channel of the shell/cushion.
4. A mask system as claimed in claim 3 wherein in at least a nasal bridge region of the shell/cushion adapted to contact the nasal bridge region of a patient the rear flange is from 1mm to 3mm thick.
5. A mask system as claimed in claim 4 wherein the rear flange is approximately 2mm thick.
6. A connection piece for connecting a mask to a conduit which can carry an air flow to said mask, said connection piece including an inlet and an outlet and a passage wall to carry said air flow therebetween, the connection piece including, in the vicinity of said outlet between said outlet and said inlet, a vent wall extending away from said passage wall, said vent wall including at least one aperture therethrough.
7. A connection piece as claimed in claim 6, wherein said connection piece is formed integrally with said mask.
8. A connection piece as claimed in claim 6, wherein said piece is formed separately of said mask and can be joined or attached thereto.
9. A connection piece as claimed in any one of claims 6 to 8, wherein said piece is formed integrally with said conduit.
10. A connection piece as claimed in any one of claims 6 to 8, wherein said piece is formed separate from said conduit and can be joined or attached thereto.
11. A connection piece as claimed in any one of claims 6 to 10, wherein said connection piece is formed so that the outlet lies at any appropriate angle to said inlet.
12. A connection piece as claimed in claim 11, wherein said connection piece is formed so that said outlet lies at an angle to said inlet which angle is in the range of 90° to 180°.
13. A connection piece as claimed in claim 12, wherein said connection piece is a 90° elbow.
14. A connection piece as claimed in any one of claims 6 to 13, wherein said piece includes attachment structure to attach said connection piece to said mask.
15. A connection piece as claimed in claim 14, wherein said attachment structure includes at least one snap-in undercut to engage a mating flange on said mask.
16. A connection piece as claimed in claim 14 or 15, wherein said attachment structure releasably attaches said connection piece to said mask.
17. A connection piece as claimed in claim 16, wherein said attachment structure includes moveable portions on which said snap-in undercuts are formed, said moveable portions allowing said undercuts to disengage said flange.

18. A connection piece as claimed in any one of claims 14 to 17, wherein said attachment structure allows rotation of said connection piece relative to said mask.
19. A connection piece as claimed in any one of claims 6 to 13, wherein said piece includes attachment means to attach said connection piece to said mask.
20. A connection piece as claimed in claim 19, wherein said attachment means includes at least one snap-in undercut to engage a mating flange on said mask.
21. A connection piece as claimed in claim 19 or 20, wherein said attachment means releasably attaches said connection piece to said mask.
22. A connection piece as claimed in claim 21, wherein said attachment means includes moveable portions on which said snap-in undercuts are formed, said moveable portions allowing said undercuts to disengage said flange.
23. A connection piece as claimed in any one of 19 to 22, wherein said attachment means allows rotation of said connection piece relative to said mask.
24. A connection piece as claimed in any one of claims 6 to 23, wherein said connection piece includes a Luer port through said passage wall.
25. A connection piece as claimed in any one of claims 6 to 24, wherein said vent wall lies at an oblique angle to said air flow.
26. A connection piece as claimed in claim 25, wherein said angle is in the range of 25° to 155°.
27. A connection piece as claimed in any one of claims 6 to 26, wherein said piece includes on its external surface a recess having wall portions extending away from an external side of said vent wall.
28. A connection piece as claimed in claim 27, wherein said wall portions diverge in a direction away from said vent wall.
29. A mask for treating sleep disordered breathing, said mask having a shell/cushion with an inner and outer surface, a flange extending away from said outer surface and surrounding said shell/cushion, said mask having an exoskeletal frame having a shape which substantially matches the contours of said flange so that said frame can be positioned adjacent said flange when said shell/cushion is in a shape suitable for use by a patient, and structure to hold said flange to said frame.
30. A mask as claimed in claim 29, wherein said structure to hold said flange to said ring member includes one or more apertures through said flange.
31. A mask as claimed in claim 29, wherein rivets or other fixers pass through said apertures to hold said flange adjacent said frame.
32. A mask as claimed in any one of claims 29 to 31, wherein said frame is optionally structured for attachment to headgear to position said mask onto a patient's head.
33. A mask for treating sleep disordered breathing, said mask having a shell/cushion with an inner and outer surface, a flange extending away from said outer surface and surrounding said shell/cushion, said mask having an exoskeletal frame having a shape which substantially matches the contours of said flange so that said frame can be positioned adjacent said flange when said shell/cushion is in a shape suitable for use by a patient, and means to hold said flange to said frame.

34. A mask as claimed in claim 33, wherein said means to hold said flange to said ring member includes one or more apertures through said flange.
35. A mask as claimed in claim 33, wherein rivets or other fixers pass through said apertures to hold said flange adjacent said frame.
36. A mask as claimed in any one of claims 33 to 35, wherein said frame includes means for attachment to headgear to position said mask onto a patient's head.
37. A mask as claimed in any one of claims 29 to 36, wherein said frame includes at least one connection member connected to said frame for cooperating therewith to sandwich said flange between said at least one connection member and said frame.
38. A mask as claimed in claim 37, wherein said at least one connection member is hinged to said frame.
39. A mask as claimed in claim 37, wherein said at least one connection member is connected to said frame by a flexible connection.
40. A mask as claimed in any one of claims 29 to 39, wherein a second ring member of a shape which substantially matches the contours of said flange, whereby said flange is sandwiched between said first mentioned ring member and said second ring member.
41. A mask as claimed in any one of claims 29 to 40, wherein said second ring member, said flange and said first mentioned ring member are held together via rivets and/or fixers.
42. A mask as claimed in claim 41, wherein said second ring member includes rivets extending therefrom, which can pass through said flange and said first mentioned ring member.
43. A mask as claimed in claim 41, wherein said first mentioned ring member includes rivets extending therefrom, which can pass through said flange and said second ring member.
44. A mask as claimed in claim 41, wherein said flange includes a first set of rivets extending in a forward direction and a second set of rivets extending in a rearward direction, said first set of rivets being received in apertures through said first mentioned ring member, said second set of rivets being received in apertures through said second ring member,
45. A mask as claimed in any one of claims 42 to 44, wherein said rivets are deformable at their free end.
46. A mask as claimed in any one of claims 42 to 44, wherein said rivets include a deformable undercut so that the undercut can pass through said apertures to then resume their shape to hold components together.
47. A mask system including head gear and mask as claimed in any one of claims 29 to 46.
48. A mask system as claimed in claim 47, wherein said mask system includes a connection piece as claimed in anyone of claims 6 to 28.
49. A mask system including headgear, a mask and a connection piece as claimed in any one of claims 6 to 28.
50. A mask system as claimed in claim 1 or 2, wherein said elbow includes structure to prevent said aperture separating from said retaining ring during normal use.
51. A mask system as claimed in claim 1 or 2, wherein said elbow provides means to prevent said aperture separating from said retaining ring during normal use.
52. A mask system as claimed in any one of the preceding claims wherein said elbow or said connection piece when separate from said mask has a cylindrical outlet.

53. A mask system as claimed in claim 52, wherein said shell/cushion includes an annular flange which when assembled with said elbow or said connection piece engages a rim of said outlet to thereby suitably seal said outlet to said flange.